UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF NEW YORK

ARTEC EUROPE S.À.R.L., Plaintiff, v. SHENZHEN CREALITY 3D TECHNOLOGY CO., LTD., AND KICKSTARTER, PBC, Defendants.	Civil Action No. 1:22-1676 (WFK)(VMS) **DECLARATION OF GLEB GUSEV**

DECLARATION OF GLEB GUSEV

I, Gleb Gusev, declare:

1. I am a Co-Founder and Chief Technology Officer of Artec Europe S.à r.l. ("Artec"). I previously provided a declaration in support of Artec's Application for a Temporary Restraining Order and Preliminary Injunction (the "Application"). *See* Declaration of Gleb Gusev, March 25, 2022 (Docket 4) ("Gusev Declaration"). I am now providing this additional declaration in response to defendants' Shenzhen Creality 3D Technology Co. Ltd.'s ("Creality's") and Kickstarter, PBC's ("Kickstarter's") statements in their oppositions to Artec's Application. If called as a witness, I could and would also testify completely to these facts under oath.

2. As I previously declared, I am Artec's Co-Founder and Chief Technology Officer, and I have been extensively involved in developing Artec's 3D scanners and 3D software.

3. In my previous declaration, I discussed an "anomalous artifact" that appears in the Artec Studio software which can be caused by a user's circular motion to exhibit anomalous behavior and to rotate the entire x, y, and z axes – anomalous behavior that is duplicated in the CR

Studio software. *See Gusev* Declaration ¶ 16. The code in the Artec Studio software that has these characteristics and causes this anomalous behavior is proprietary to Artec.

4. Artec owns U.S. Patent 7,768,656 (the '656 Patent) relating to a system and method to scan, measure, and capture a shape of objects in three dimensions. Various claims of the '656 Patent are directed to projecting a structured light pattern onto an object to measure the shape of the object.

5. Under my direction, Artec obtained a Creality CR-Scan 01 scanner and downloaded the associated CR Studio software to test it. Exhibit A to this declaration is an infringement claim chart that provides examples of how the CR-Scan 01 scanner and the CR Studio software satisfy each and every element of, for example, claim 1 of the '656 Patent. In particular and by way of example, testing confirmed the CR-Scan 01 scanner projects and captures an image with coded elements characterized by at least one parameter and the coded elements are projected in a line on an object as covered by claim 1 of the '656 Patent. The images included on pages 5 and 10 in Exhibit A show different coded elements arranged in at least two groups.

6. A calib.txt file, reproduced on page 6 in Exhibit A, included with the CR Studio software includes data for defining virtual lines used in the computation of the measurements of the coded elements on the object. As detailed on pages 6-9 of Exhibit A, our testing further confirmed that when the virtual lines were artificially shifted or inclined, the CR Studio software could no longer properly generate the object. This shows that the virtual lines are used to determine the measurements relating to the shape of the object as covered by claim 1 of the '656 Patent.

7. Testing of the CR-Scan 01 scanner and the CR Studio software also revealed that the CR-Scan 01 scanner projects a structured light pattern onto an object to measure the shape of the object. Further, the structured light pattern projected by the CR-Scan 01 scanner is remarkably

similar to the structured light pattern illustrated in figure 13 of the ’656 Patent. Images on page 4 of Exhibit A to this declaration show the structured light pattern projected by the CR-Scan 01 scanner obtained through testing.

8. The structured light pattern that is projected by the predecessor to Creality’s CR Scan 01 Scanner, the MagicWand scanner, is nearly identical to the structured light pattern that is projected by the Artec Eva scanner.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed on this 6th day of April, in Luxembourg, Grand-Duchy of Luxembourg.

Gleb Gusev

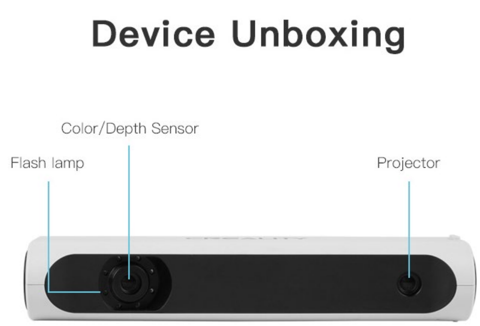
EXHIBIT A

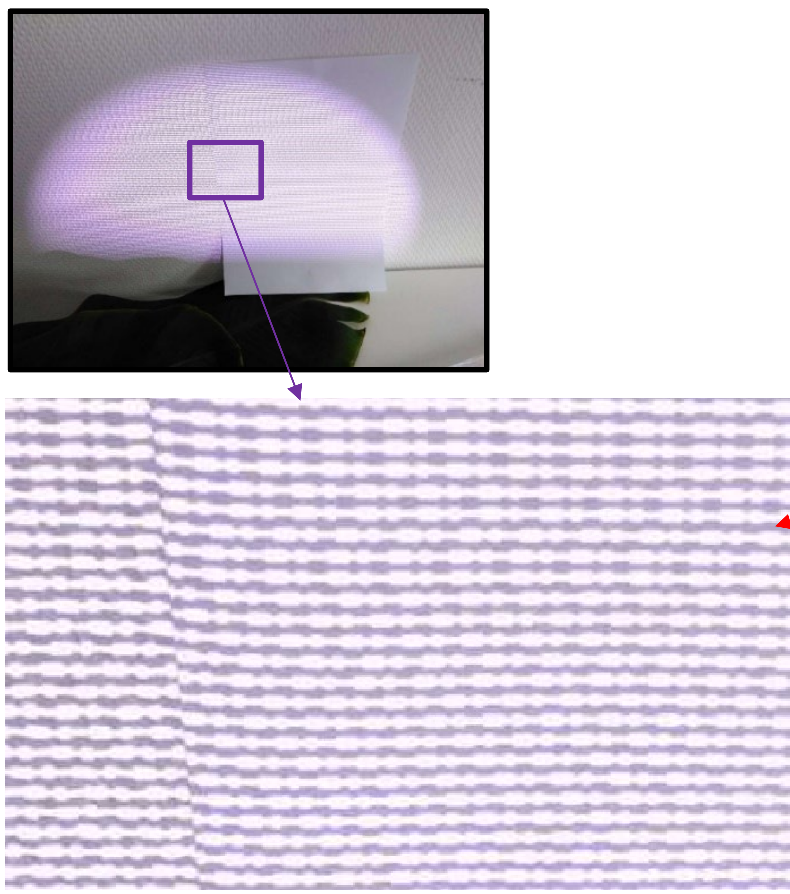
EXHIBIT A: Infringement Claim Chart for U.S. Patent No. 7,768,656

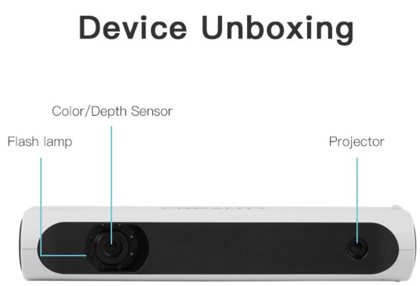
US 7,768,656	CR-Scan 01 scanner and CR Studio
1. A system for the 3D measurement of the shape of a material object, comprising:[1]	As illustrated, by way of example in the below images, Creality (e.g., Shenzhen Creality 3D Technology Co., Ltd and its subsidiaries) makes, uses, sells, and/or offers for sale a system that includes a CR-Scan 01 scanner that, in connection with CR Studio software can measure the 3D shape of an object.   

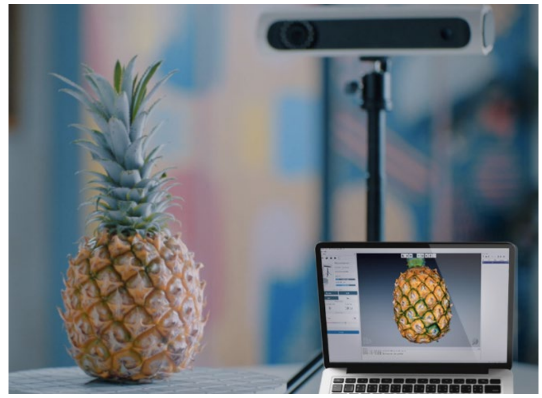
[1] The discussion of claim 1 herein is intended as an example of evidence of infringement of the U.S. Patent No. 7,768,656. Several additional claims of the U.S. Patent No. 7,768,656 are also believed to be infringed by the CR-Scan 01 scanner and CR Studio software.

<table>
<tr>
<td>a light projector for projecting a structured light pattern onto a surface of said object, wherein said light projector comprises a light source, a slide with a slide pattern located on a slide surface, and a projector lens characterized by a projector lens vertex;</td>
<td>The CR-Scan 01 includes a projector that includes a slide that produces a slide pattern. The projector includes a light source, a slide pattern, and a lens having a lens vertex. The below images from product testing reveals that the projector projects a structured light pattern.

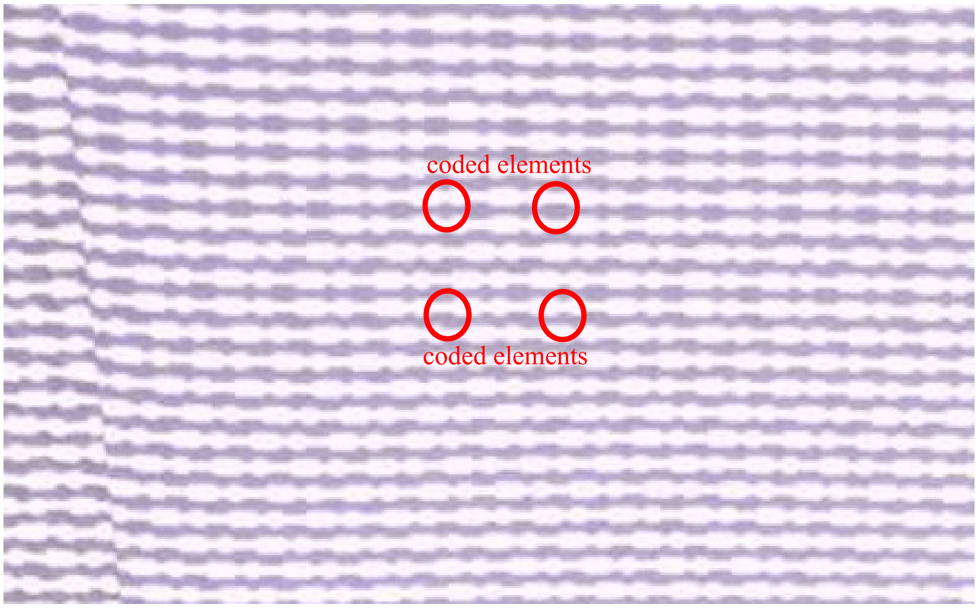
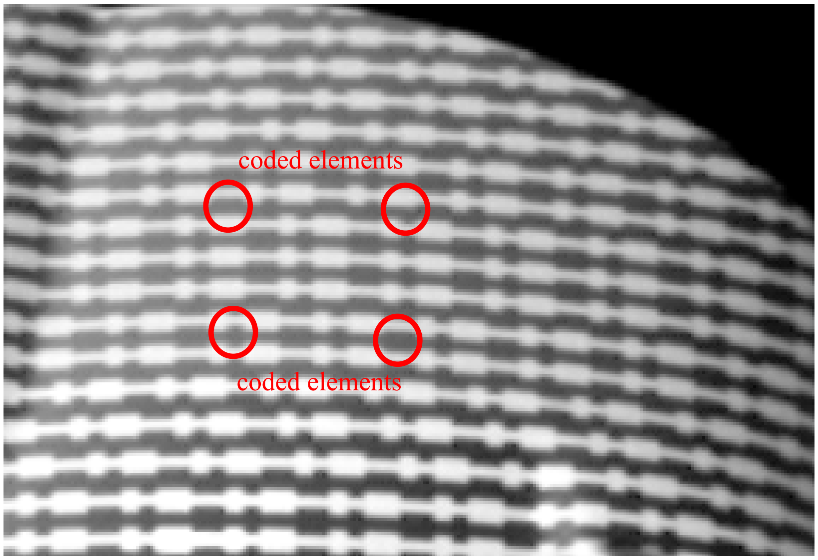




Structured Light Pattern</td>
</tr>
</table>

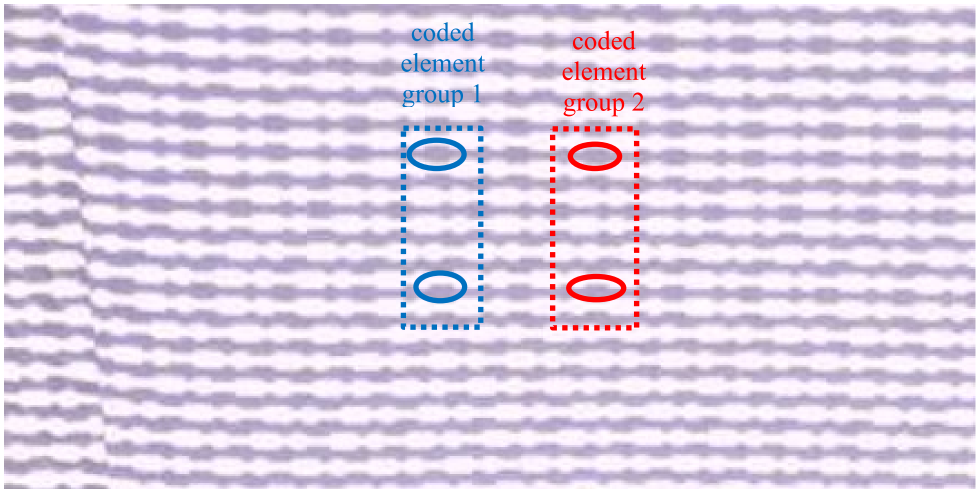
<table>
<tr>
<td>a device for capturing an image of said structured light pattern reflected on said object, wherein said device for capturing an image comprises a device lens characterized by a device lens vertex; and</td>
<td>The CR-Scan 01 has a color/depth sensor that captures an image of an object. The color/depth sensor has a lens that inherently has a vertex.


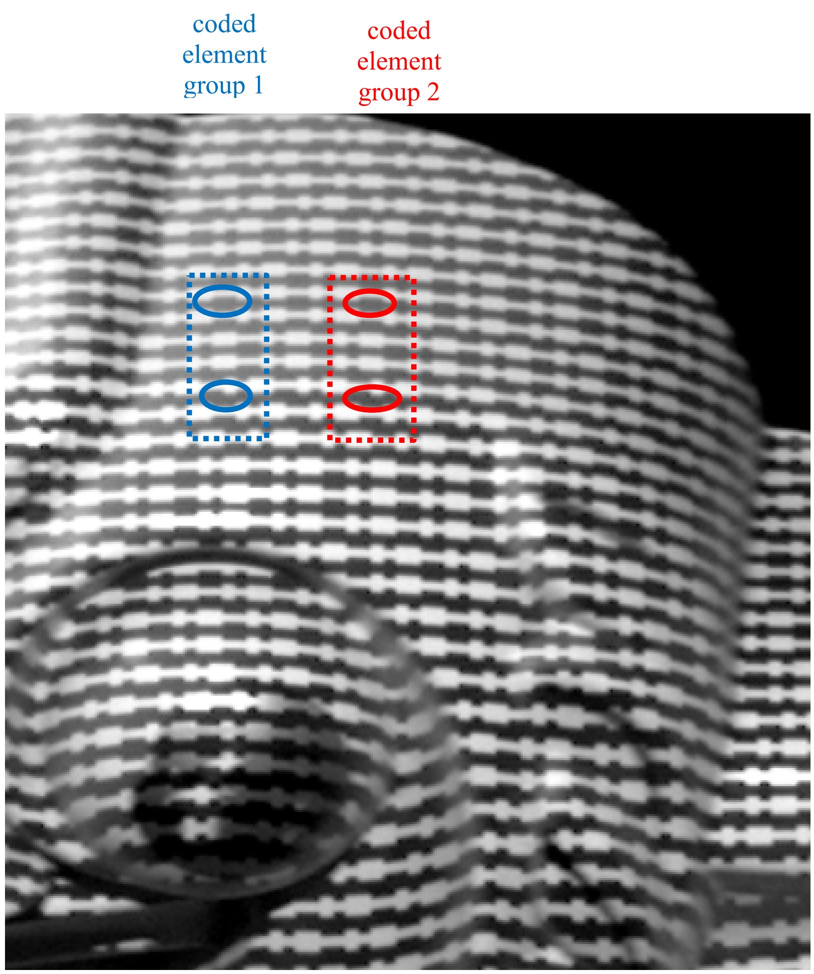
</td>
</tr>
<tr>
<td>a computing device for determining a measurement relating to the shape of said object using a triangulation algorithm based on a correspondence between points in said slide pattern and said image, and</td>
<td>The depth sensor and the projector are positioned in a manner indicating that the CR-scan 01 or the computing device running the CR Studio software for the CR-scan 01 uses a triangulation algorithm to determine measurements between points in the slide pattern and the image. Additional examples are discussed below.


</td>
</tr>
</table>

wherein said slide pattern comprises a plurality of coded elements, where each of said coded elements is characterized by at least one parameter and, where said at least one parameter defines a spatial or temporal distribution of an amplitude or a wavelength of said structured light, and	In the example images below, product testing reveals that the slide pattern of the CR-scan 01 includes coded elements (circled in red below) that are characterized by a parameter that defines a spatial or temporal distribution of amplitude or wavelength of the structured light.  

wherein said coded elements are assigned to one of at least first group or second group, each of which first group and second group comprising at least two of said coded elements, and	Product testing reveals that the slide pattern for the CR-scan 01 projects coded elements in at least two groups (boxed in red and blue) and each group includes at least two coded elements.





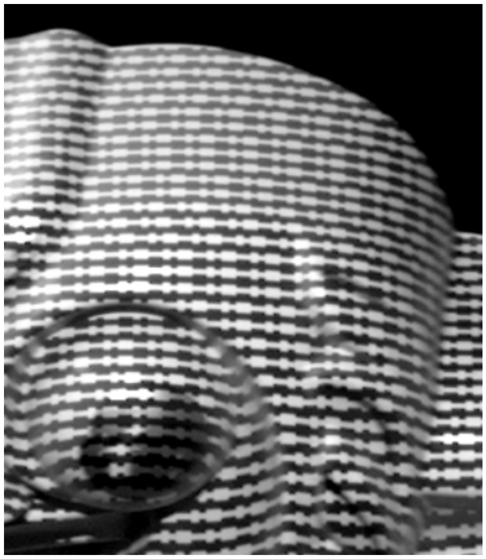
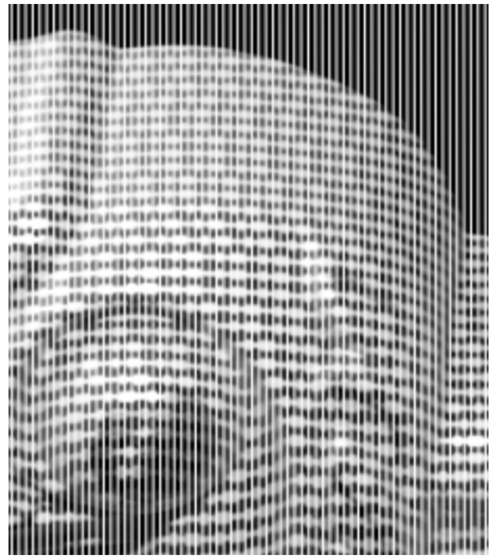
wherein at least a first slide virtual line and a second slide virtual line are defined on said slide surface, where said first slide virtual line is defined by an intersection between said slide surface and a first plane passing through said projector lens vertex and through said device lens vertex, and said second slide virtual line is defined by an intersection between said slide surface and a second plane passing through said projector lens vertex and through said device lens vertex, and

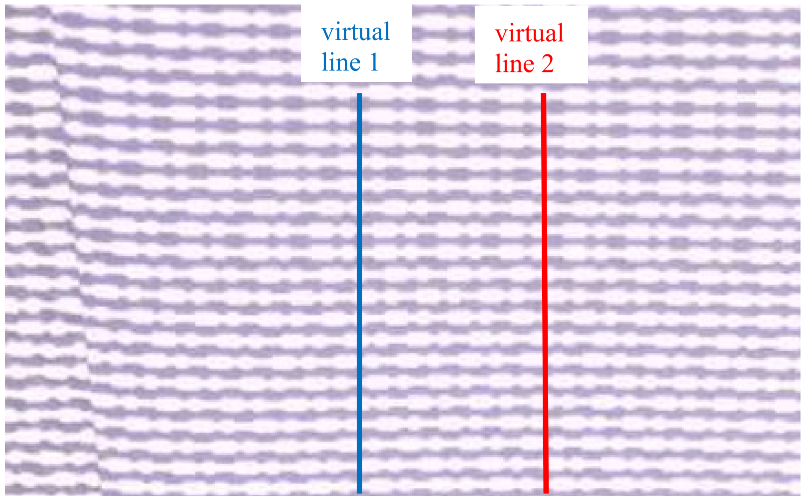
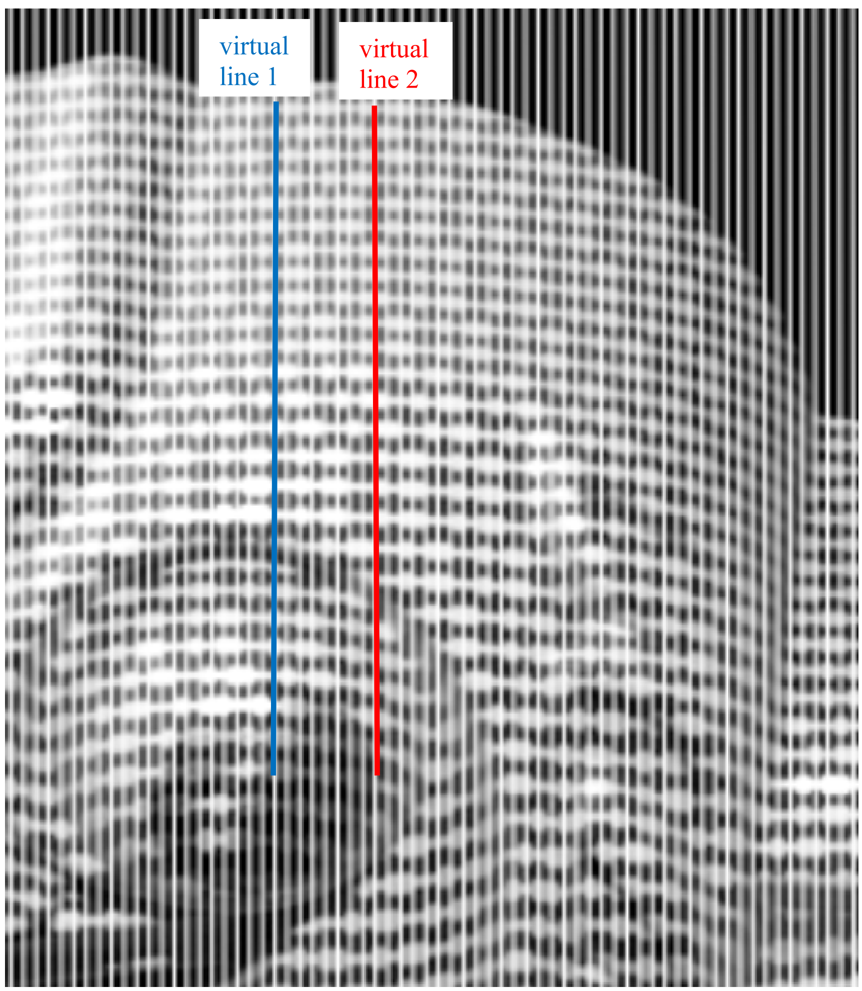
As one example, the CR Studio software uses virtual lines to establish correspondence between points in said slide pattern and the image. Product testing reveals that the CR-scan 01 comes with a calibration file "calib.txt" which contains parameters for the virtual lines within the scanner used to establish the correspondence. An example of the calib.txt is shown below, where 213 virtual lines are expressed in terms of slope and offset values for each virtual line.

```
1280 1024
8.500000 4.700000
216 150
0 -65
2523.323242 2522.548096 632.101318 505.724731 -0.005913 0.186465 -0.000640 0.001402 -1.013536 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000
2523.323242 2522.548096 632.101318 505.724731 -0.005913 0.186465 -0.000640 0.001402 -1.013536 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000
1733.419312 2236.969482 535.119019 490.124969 0.009166 0.063442 0.000674 -0.000466 -0.360431 0.002388 0.297537 0.008216 -154.632553 0.139644 -1.821159
213
1 -0.001636 16.838760
2 -0.001649 21.479584
3 -0.001215 25.647215
4 -0.001044 30.253048
5 -0.001074 35.036307
6 -0.001203 39.873664
7 -0.001197 44.556425
8 -0.001434 49.433266
9 -0.001478 54.160615
10 -0.001240 58.710448
11 -0.001180 63.404229
12 -0.001215 68.133523
13 -0.001225 72.840488
14 -0.001345 77.617599
15 -0.001358 82.309807
16 -0.001168 86.895106
17 -0.001087 91.570725
18 -0.001120 96.292608
19 -0.001107 100.979001
20 -0.001218 105.756620
21 -0.001242 110.470135
22 -0.001012 115.019667
23 -0.000943 119.690006
24 -0.000981 124.422595
25 -0.000954 129.106219
26 -0.001057 133.878140
27 -0.001075 138.575451
28 -0.000878 143.150280
29 -0.000786 147.814438
30 -0.000799 152.533214
31 -0.000813 157.240731
32 -0.000915 161.999813
33 -0.000922 166.698400
34 -0.000741 171.298587
```

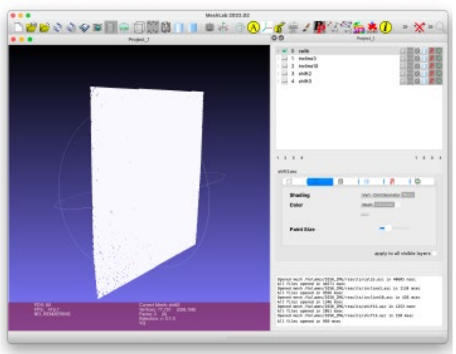
Content of file calib.txt coming with each CR Scan 01 scanner

Testing reveals that modifying these parameters changes the ability of the CR Studio software to correctly reconstruct the scanned object. The below images illustrate reconstruction attempts from scanning of a wall while changing (e.g., shifting or inclining) the parameters. As one example in the images shown below, the more the parameters are shifted or inclined less the CR Studio software is able correctly reconstruct the scanned object. As another example in the images shown below, the lower a pixel is in the scan the less likely the CR Studio software is able correctly reconstruct the scanned object when the inclination of the virtual lines is modified.

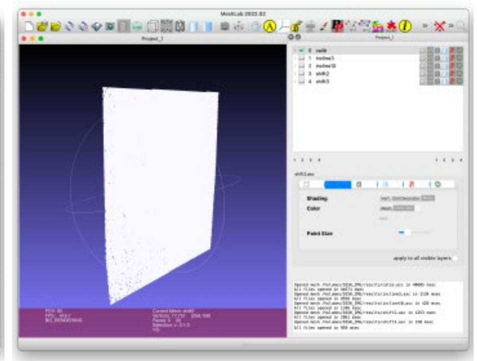
	As an illustration, the virtual lines for the scanner are imposed on an image obtained from the CR Studio software that was generated from the sensor of the scanner.   Image from CR studio showing the pattern projected onto an object — Image from CR studio with virtual lines imposed

	Product testing reveals that the slide with the slide pattern for the CR-scan 01 results in multiple virtual slide lines (e.g., red line and blue line below) that intersect first and second planes (red plane and blue plane below) through the projector vertex and the color/depth sensor vertex. The virtual lines pass through the projector lens vertex and the device lens vertex.  

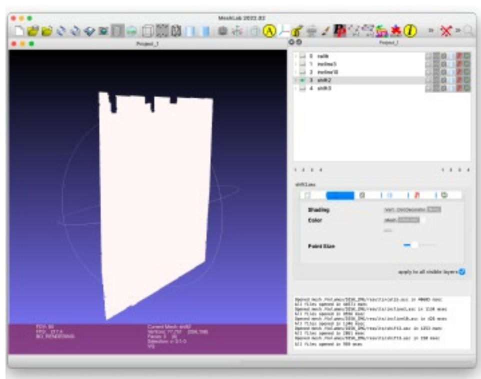
Testing further reveals that modifying these parameters changes the ability of the CR Studio software to correctly reconstruct the scanned object. The below images illustrate reconstruction attempts from scanning of a wall while changing (e.g., shifting or inclining) the parameters. As one example in the images shown below, the more the parameters are shifted or inclined less the CR Studio software is able correctly reconstruct the scanned object. As another example in the images shown below, the lower a pixel is in the scan the less likely the CR Studio software is able correctly reconstruct the scanned object when the inclination of the virtual lines is modified.



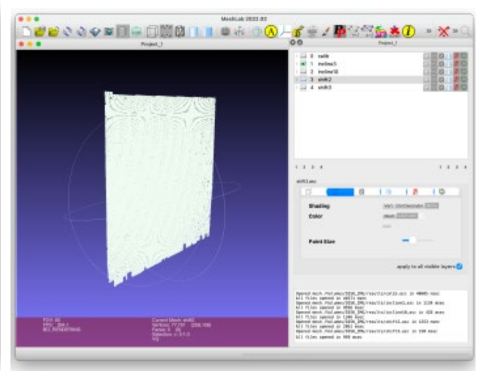
no shift



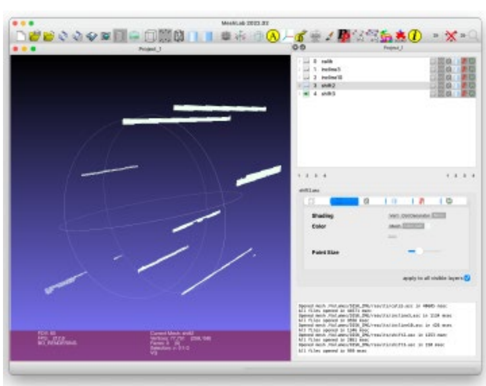
no inclination



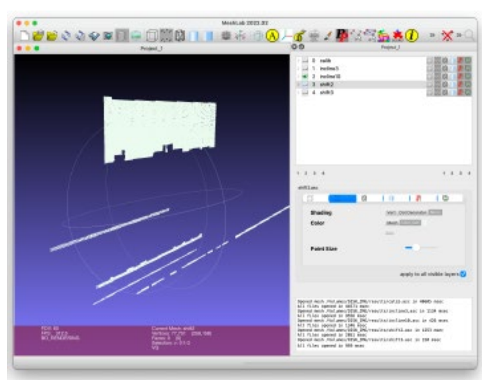
shift 2 pix



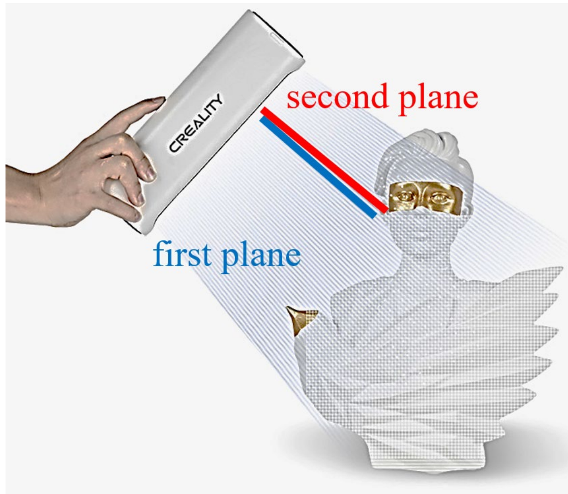
inclination of 3/1280



shift 3 pix



inclination of 10/1280

	As illustrated by way of example below, these virtual lines are defined by a planes that pass through the projector lens vertex and the device lens vertex. 
wherein said coded elements of said first group are located along said first virtual line and said coded elements of said second group are located along said second virtual line.	Product testing reveals that the slide pattern used with the CR-scan 01 includes coded elements in a first group along a first virtual line (red) and coded elements of a second group along a second virtual line (blue).